

**REMARKS**

**Introduction**

In response to the Office Action dated January 10, 2007, Applicants have amended the title and claims 1, 5, 9, and 10. Claims 12-14 have been added. Care has been taken to avoid the introduction of new matter. Claim 8 has been cancelled. In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

**Specification**

The Office Action asserted that the Title is not descriptive and required a new Title. In response, the Applicants have amended the title of the invention. Accordingly, withdrawal of the objection to the specification is respectfully solicited.

**Claim Rejection Under 35 U.S.C. § 112**

Claims 5 and 8-10 were rejected under 35 U.S.C. § 112, second paragraph, as purportedly being indefinite.

Claim 5 was rejected for reciting "...a 2-m cutoff wavelength." Claim 5 has been amended to recite, "...wherein the at least one optical fiber has a 2-m cutoff wavelength of at most 1600 nm measured on 2-m length portion of the at least one optical fiber." According to the International Telecommunications Union (ITU-T), the phrase "a 2-m cutoff wavelength" is defined as a standard length of fibre used during a testing method for the cut-off wavelength measurement of single-mode fibres intended to assure effective single-mode operation above a specified wavelength (*see, e.g.*, ITU-T Recommendation G.650.1, "Definitions and test methods

for linear, deterministic attributes of single-mode fibre and cable,” 06/2002, pg. 23-27). The ITU-T requires that this testing method be performed on a 2-m length of fibre (sec. 5.3.1.3.1 of ITU-T Recommendation G.650.1). The 2-m length of fibre is the test fibre, which is used to determine the output power  $P_1(\lambda)$ . In the present application, it is desirable that the optical fibers  $F_1$  to  $F_m$  have a 2-m cutoff wavelength of at most 1600 nm (*see, e.g.*, pg. 10, lines 12-13 of the present application).

Claim 8 was rejected for reciting “...an  $\alpha$  parameter of at least 1.0.” Claim 8 has been canceled. Claim 1 has been amended to recite, “...wherein the at least one signal corresponding to the at least one wavelength has an  $\alpha$  parameter of at least 1.0 at the output end of the corresponding directly modulated light source.” According to the Journal of Quantum Electronics, the alpha parameter,  $\alpha$ , measures the change in carrier density and the change in the refractive index (*see*, IEEE Journal of Quantum Electronics, Vol. QE-18, No. 2, Feb. 1982, pg. 259-264). The value for the alpha parameter,  $\alpha$ , is determined from measurements of the refractive index and gain change of each corresponding light source (pg. 261, col. 2, lines 38-39). In the present application, the alpha parameter,  $\alpha$ , of the signal corresponding to a wavelength may be at least 1.0 at the output end of the corresponding light source in the directly modulated light sources  $S_1$  to  $S_n$  (*see*, pg. 11, lines 13-15 of the present application). Thus, claim 1 recites the invention with the degree of precision and particularity required by the statute.

Claim 9 was rejected for reciting, “...a feature expressed by the formula.” To expedite prosecution, claim 9 is amended to clearly delineate that subject matter of the invention. More specifically, claim 9 has been amended to recite, “...wherein the at least one optical fiber has a non-linearity constant  $\gamma$  at the at least one wavelength and a power  $P_{in}$  of the signal lightwave to

be inputted into the at least one optical fiber having the formula,  $\gamma P_{in} > 1.51 \times 10^{-6}/m$ .” Thus, claim 9 recites the invention with the degree of precision and particularity required by the statute.

Claim 10 was rejected for reciting, “...a bit rate of  $B$  Gb/s” and “at least  $-80,000B_2$  ps/nm.” To expedite prosecution, claim 10 has been amended to clearly delineate that subject matter of the invention. More specifically, claim 10 is amended to recite, “...where  $B$  represents a bit rate of the at least one signal corresponding to the at least one wavelength.” Support for this amendment is found on, *e.g.*, pg. 12, lines 1-10; Fig. 3; and pg. 20, line 16 – pg. 21, line 2. Thus, claim 10 recites the invention with the degree of precision and particularity required by the statute.

Therefore, it is respectfully urged that the rejection of claims 5 and 8-10, as being indefinite, be withdrawn.

#### **Claim Rejection Under 35 U.S.C. § 103**

Claims 1-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Luo (“Non-zero dispersion shifted fiber with low dispersion slope,” Luo et al. Communications, APCC/OECC 1999, Fifth Asia-Pacific conference, Vol. 2, Oct. 22, 1999, pp. 1373-1374); and further in view of Culverhouse (“Corning MetroCor Fiber and its Application in Metropolitan Networks,” Culverhouse et al., July 2000).

Claim 1 has been amended to recite, “...wherein the at least one signal corresponding to the at least one wavelength has an  $\alpha$  parameter of at least 1.0 at the output end of the corresponding directly modulated light source.”

The Office Action states, “Luo ...does not disclose directly modulated light sources.” The Office Action relies on Culverhouse to cure the deficiencies of Luo.

Culverhouse discusses directly modulated light sources (abstract). However, Culverhouse is silent on "...wherein the at least one signal corresponding to the at least one wavelength has an  $\alpha$  parameter of at least 1.0 at the output end of the corresponding directly modulated light source" as required by amended claim 1. Thus, amended claim 1 is patentable over Luo and Culverhouse and its allowance, as well as the allowance of dependent claims 2-7 and 9-14 is respectfully submitted.

### **New Claims**

New claim 12 recites, "...wherein the at least one optical fiber has a dispersion slope of at most  $0.03 \text{ ps/nm}^2/\text{km}$  in absolute value at the at least one wavelength." New claim 13 recites, "...wherein the at least one optical fiber has a dispersion slope of at most  $0.01 \text{ ps/nm}^2/\text{km}$  in absolute value at the at least one wavelength. Nothing in the cited references teach or suggest the described subject matter. It is submitted that these new claims distinguish over the cited references.

### **Conclusion**

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

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including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Lisa A. Kilday  
Registration No. 56,210

600 13<sup>th</sup> Street, N.W.  
Washington, DC 20005-3096  
Phone: 202.756.8000 SAB:LAK  
Facsimile: 202.756.8087  
**Date: April 5, 2007**

**Please recognize our Customer No. 20277  
as our correspondence address.**